**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1-7. (canceled)

8. (previously presented) A signal fault detection system useable in electrical control sensors for shaft speed signal frequency change rate tests, detecting intermittent or "in-range" failures of the signal rate of change, comprising:

means for measuring frequency of a shaft speed signal;

means for calculating a rate of change (time derivative) of the measured signal;

means for estimating a short-term variance of the measured signal rate of change using the equation: $Var[x] = E[x - E(x)]^2 = E[x^2] - E^2[x]$, where x is the measured signal rate of change, E(x) is the expected value of x, $E[x^2]$ is the expected value of $x^2$, calculated by estimating the average of $x^2$ over a predefined short term, and $E^2[x]$ is the squared value of E[x], where E[x] is calculated by estimating the average of the measured signal rate of change over the predefined short term;

means for estimating the short-term variance $Var[x] = E[x^2] - E^2[x]$ by employing the following algorithm: $Var[x] = \text{Filtered}\ [(x)^2] - (\text{Filtered}\ [x])^2$;

means for comparing the estimated variance with a predefined variance limit for a predefined amount of time; and

means for deeming the measured signal invalid, if the estimated variance exceeds the predefined variance limit for the predefined amount of time.

9. (original) The system according to claim 8, wherein the means for comparing the estimated variance with a predefined variance limit for a predefined amount of time includes a latching counter.

10. (previously presented) The system according to claim 9, wherein the latching counter time out rate being proportional to a time period the measured input is one.

11. (original) The system according to claim 8, wherein the means for estimating a short-term variance of the measured signal rate of change includes a plurality of filters performing averaging function.

12. (original) The system according to claim 11, wherein the filters selected from a group comprising analog filters, digital IIR filters, digital FIR filters, and rolling average filters.

13. (currently amended) The system according to claim 8, wherein the system being implemented in a software program includes a set of computer-executable program instructions executed within ~~the~~ a gas turbine engine control system.

14. (original) The system according to claim 8, wherein the system being implemented is in a hardware circuitry.

15-21. (canceled)

22. (previously presented) A method useable in electrical control sensors for shaft speed signal frequency change rate tests, detecting

intermittent or "in-range" failures of the signal rate of change, comprising the following steps:

(a) measuring frequency of a shaft speed signal;

(b) calculating a rate of change (time derivative) of the measured signal;

(c) estimating a short-term variance of the measured signal rate of change using the equation: $Var[x] = E[x - E(x)]^2 = E[x^2] - E^2[x]$, where x is the measured signal rate of change, E(x) is the expected value of x, $E[x^2]$ is the expected value of $x^2$, calculated by estimating the average of $x^2$ over a predefined short term, and $E^2[x]$ is the squared value of E[x], where E[x] is calculated by estimating the average of the measured signal rate of change over the predefined short term;

(d) estimating the short-term variance $Var[x] = E[x^2] - E^2[x]$ by employing the following algorithm: $Var[x] = \text{Filtered } [(x)^2] - (\text{Filtered } [x])^2$;

(e) comparing the estimated variance with a predefined variance limit for a predefined amount of time; and

(f) if the estimated variance exceeds the predefined variance limit for the predetermined amount of time, deeming the measured signal invalid.

23. (original) The method according to claim 22, wherein the step for comparing the estimated variance with a predefined variance limit for a predefined amount of time uses a latching counter.

24. (previously presented) The method according to claim 23, wherein the latching counter time out rate being proportional to a time period the measured input is one.

25. (currently amended)The method according to claim 22, wherein the step for estimating a short-term variance of the measured signal rate of change using a plurality of filters ~~perform~~ performing averaging function.

26. (original) The method according to claim 25, wherein the filters selected from a group comprising analog filters, digital IIR filters, digital FIR filters, and rolling average filters.

27. (currently amended)The method according to claim 22, wherein the method being implemented in a software program includes a set of computer-executable program instructions executed within ~~the~~ a gas turbine engine control system.

28. (original) The method according to claim 22, wherein the method being implemented is in a hardware circuitry.

29. (previously presented) A signal fault detection system for an engine compressor fan having a shaft speed signal Nfan, comprising:

means for measuring frequency of the shaft speed signal Nfan;

means for calculating a rate of change (time derivative) of the measured signal;

means for estimating a short-term variance of the measured signal rate of change using the equation: Var[d(Nfan)/dt] = E[d(Nfan)/dt – E(d(Nfan)/dt)]$^2$ = E[(d(Nfan)/dt)$^2$] - E$^2$[d(Nfan)/dt], where d(Nfan)/dt is the measured signal rate of change, E(d(Nfan)/dt) is the expected value of d(Nfan)/dt, E[(d(Nfan)/dt)$^2$] is the expected value of (d(Nfan)/dt)$^2$, calculated by estimating the average of (d(Nfan)/dt)$^2$ over a predefined short term, and E$^2$[d(Nfan)/dt] is the squared value of E[d(Nfan)/dt], where E[d(Nfan)/dt] is calculated by estimating the average of the measured signal rate of change over the predefined short term;

means for comparing the estimated variance with a predefined variance limit for a predefined amount of time; and

means for deeming the measured signal invalid, if the estimated variance exceeds the predefined variance limit for the predefined amount of time.

30. (previously presented) A method for signal fault detection for an engine compressor fan having a shaft speed signal Nfan, comprising:

measuring frequency of the shaft speed signal Nfan;

calculating a rate of change (time derivative) of the measured signal;

estimating a short-term variance of the measured signal rate of change using the equation: $Var[d(Nfan)/dt] = E[d(Nfan)/dt - E(d(Nfan)/dt)]^2 = E[(d(Nfan)/dt)^2] - E^2[d(Nfan)/dt]$, where d(Nfan)/dt is the measured signal rate of change, E(d(Nfan)/dt) is the expected value of d(Nfan)/dt, $E[(d(Nfan)/dt)^2]$ is the expected value of $(d(Nfan)/dt)^2$, calculated by estimating the average of $(d(Nfan)/dt)^2$ over a predefined short term, and $E^2[d(Nfan)/dt]$ is the squared value of E[d(Nfan)/dt], where E[d(Nfan)/dt] is calculated by estimating the average of the measured signal rate of change over the predefined short term;

comparing the estimated variance with a predefined variance limit for a predefined amount of time; and

deeming the measured signal invalid, if the estimated variance exceeds the predefined variance limit for the predefined amount of time.

31. (currently amended)A signal fault detection method useable in electrical control sensors for temperature signal change rate tests, detecting intermittent or "in-range" failures of the signal, comprising:

means for measuring a temperature signal;

means for estimating a short-term variance of the measured signal using the equation: $Var[x] = E[x - E(x)]^2 = E[x^2] - E^2[x]$, where x is the measured signal, E(x) is the expected value of x, $E[x^2]$ is the expected value of $x^2$, calculated by estimating the average of $x^2$ over a predefined short term, and

$E^2[x]$ is the squared value of $E[x]$, where $E[x]$ is calculated by estimating the average of the measured signal x over a predefined short term;

means for estimating the short-term variance $Var[x] = E[x^2] - E^2[x]$ by employing the ~~following~~ algorithm~~:~~ expressed as $Var[x] = Filtered [ (x)^2 ] - ( Filtered [x] )^2$~~. In this algorithm~~, wherein the approximate value of the expectation operation (E), which is the estimated short term average signal x, is obtained by an averaging filter~~.~~;

means for comparing the estimated variance with a predefined variance limit for a predefined amount of time; and

means for deeming the measured signal at least one of faulted ~~or~~ and invalid, if the estimated variance exceeds the predefined variance limit for the predefined amount of time.

32. (previously presented) The system according to claim 31, wherein the means for comparing the estimated variance with a predefined variance limit for a predefined amount of time includes a latching counter.

33. (previously presented) The system according to claim 31, wherein the means for estimating a short-term variance of the measured signal by employing an averaging filter to perform the expectation operation, where the averaging filter includes a plurality of filters performing averaging function in the calculation of $E[x^2]$ and $E^2[x]$.

34. (previously presented) The system according to claim 33, wherein the filters selected from a group comprising analog filters, digital IIR filters, digital FIR filters, and rolling average filters.

35. (previously presented) The system according to claim 31, wherein the system being implemented in a software program includes a set of computer-executable program instructions.

36. (previously presented) The system according to claim 31, wherein the system being implemented is in a hardware circuitry.